WHAT IS CLAIMED IS:

1. A receiving device comprising:

a receiving circuit for receiving a first signal and a second signal which are transmitted at mutually different frequencies;

a circuit for forming first and second local oscillation signals, whose frequencies are both the center frequency between said first signal and said second signal, and whose phases differ by 90° from each other;

a first mixer circuit for frequency-converting the received signal received by said receiving circuit into a first intermediate frequency signal in accordance with said first local oscillation signal;

a second mixer circuit for frequency-converting the received signal received by said receiving circuit into a second intermediate frequency signal in accordance with said second local oscillation signal;

a first phase-shift circuit to which said first intermediate frequency signal is supplied;

a second phase-shift circuit to which said second intermediate frequency signal is supplied, in which the amount of the phase shift differs by 90° from that of said first phase-shift circuit; and

an addition/subtraction circuit for performing one of

addition and subtraction between the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit,

wherein, by switching the process in said addition/subtraction circuit to said addition or said subtraction, the intermediate frequency signal corresponding to said first signal or the intermediate frequency signal corresponding to said second signal is selectively extracted from said addition/subtraction circuit.

2. A receiving device for receiving a multiplexed signal in which a first ensemble having signals of a first plurality of programs and a second ensemble having signals of a second plurality of programs are frequency-multiplexed and transmitted, and for extracting, from this received signal, one of the signals within said signals of the first plurality of programs and said signals of the second plurality of programs, said receiving device comprising:

a circuit for forming first and second local oscillation signals, whose frequencies are both the center frequency between said first ensemble and said second ensemble, and whose phases differ by 90° from each other;

a first mixer circuit for frequency-converting said received signal into a first intermediate frequency signal in accordance with said first local oscillation signal;

a second mixer circuit for frequency-converting the received signal into a second intermediate frequency signal in accordance with said second local oscillation signal;

a first phase-shift circuit to which said first intermediate frequency signal is supplied;

a second phase-shift circuit to which said second intermediate frequency signal is supplied, in which the amount of the phase shift differs by 90° from that of said first phase-shift circuit; and

an addition/subtraction circuit for performing one of addition and subtraction between the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit,

wherein, by switching the process in said addition/subtraction circuit to said addition or said subtraction, the intermediate frequency signal corresponding to said first signal or the intermediate frequency signal corresponding to said second signal is selectively extracted from said addition/subtraction circuit.

3. A receiving device according to Claim 2, further comprising:

an intermediate frequency filter to which the output signal of said addition/subtraction circuit is supplied; and

a demodulation circuit to which the output signal of

the intermediate frequency filter is supplied,

wherein, by switching the process in said addition/subtraction circuit to said addition or said subtraction, the signals of said first plurality of programs or the signals of said second plurality of programs are selectively extracted from said demodulation circuit.

4. A receiving device according to Claim 3, wherein, when each of said first ensemble and said second ensemble has a terrestrial-wave signal and a satellite-wave signal which are frequency-divided,

said intermediate frequency filter comprises first and second intermediate frequency filters,

said demodulation circuit comprises first and second demodulation circuits,

the output signal of said addition/subtraction circuit is supplied to each of said first and second intermediate frequency filters, whereby the intermediate frequency signal of said terrestrial-wave signal and the intermediate frequency signal of said satellite-wave signal are extracted from said first and second intermediate frequency filters, and

the intermediate frequency signals which are output from said first and second intermediate frequency filters are supplied to said first and second demodulation circuits,

respectively.

5. A receiving device comprising:

a receiving circuit for receiving a first signal and a second signal which are transmitted at mutually different frequencies;

a circuit for forming first and second local oscillation signals, whose frequencies are both the center frequency between said first signal and said second signal, and whose phases differ by 90° from each other;

a first mixer circuit for frequency-converting the received signal received by said receiving circuit into a first intermediate frequency signal in accordance with said first local oscillation signal;

a second mixer circuit for frequency-converting the received signal received by said receiving circuit into a second intermediate frequency signal in accordance with said second local oscillation signal;

a first phase-shift circuit to which said first intermediate frequency signal is supplied;

a second phase-shift circuit to which said second intermediate frequency signal is supplied, in which the amount of the phase shift differs by 90° from that of said first phase-shift circuit; and

an addition circuit for performing addition of the

output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit; and

a circuit for inverting or non-inverting the phase of one of the signals of the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit, which are supplied to said addition circuit,

wherein, by switching between said inversion or said non-inversion, the intermediate frequency signal corresponding to said first signal or the intermediate frequency signal corresponding to said second signal is selectively extracted from said addition circuit.

6. A receiving device according to Claim 5, wherein said phase inverting or non-inverting circuit is a circuit for inverting or non-inverting the phase of one of the signals of said first and second local oscillation signals.

7. A receiving device according to Claim 5, wherein said phase inverting or non-inverting circuit is a circuit for inverting or non-inverting the phase of one of the signals of said first and second intermediate frequency signals.

8. A receiving device for receiving a multiplexed signal in which a first ensemble having signals of a first

plurality of programs and a second ensemble having signals of a second plurality of programs are frequency-multiplexed and transmitted, and for extracting, from this received signal, one of the signals within said signals of the first plurality of programs and said signals of the second plurality of programs, said receiving device comprising:

a circuit for forming first and second local oscillation signals, whose frequencies are both the center frequency between said first ensemble and said second ensemble, and whose phases differ by 90° from each other;

a first mixer circuit for frequency-converting the received signal into a first intermediate frequency signal in accordance with said first local oscillation signal;

a second mixer circuit for frequency-converting the received signal into a second intermediate frequency signal in accordance with said second local oscillation signal;

a first phase-shift circuit to which said first intermediate frequency signal is supplied;

a second phase-shift circuit to which said second intermediate frequency signal is supplied, in which the amount of the phase shift differs by 90° from that of said first phase-shift circuit;

an addition circuit for performing addition of the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit; and

a circuit for inverting or non-inverting the phase of one of the signals of said first and second intermediate frequency signals,

wherein, by switching between said inversion or said non-inversion, the intermediate frequency signal corresponding to said first signal or the intermediate frequency signal corresponding to said second signal is selectively extracted from said addition circuit.

9. A receiving device according to Claim 8, further comprising:

an intermediate frequency filter to which the output signal of said addition circuit is supplied; and

a demodulation circuit to which the output signal of the intermediate frequency filter is supplied,

wherein, by switching between said inversion or said non-inversion, the signals of said first plurality of programs or the signals of said second plurality of programs are selectively extracted from said demodulation circuit.

10. A receiving device according to Claim 9, wherein, when each of said first ensemble and said second ensemble has a terrestrial-wave signal and a satellite-wave signal which are frequency-divided,

said intermediate frequency filter comprises first and

second intermediate frequency filters,

said demodulation circuit comprises first and second demodulation circuits,

the output signal of said addition/subtraction circuit is supplied to each of said first and second intermediate frequency filters, whereby the intermediate frequency signal of said terrestrial-wave signal and the intermediate frequency signal of said satellite-wave signal are extracted from said first and second intermediate frequency filters, and

the intermediate frequency signals which are output from said first and second intermediate frequency filters are supplied to said first and second demodulation circuits, respectively.

11. A receiving device according to Claim 10, further comprising a selecting/combining circuit for selecting or combining the demodulated outputs of said first and second demodulation circuits and for outputting the demodulated outputs.

12. A receiving device according to Claim 8, wherein said phase inverting or non-inverting circuit is a circuit for inverting or non-inverting the phase of one of the signals of said first and second local oscillation signals.

13. A receiving device according to Claim 8, wherein said phase inverting or non-inverting circuit is a circuit for inverting or non-inverting the phase of one of the signals of said first and second intermediate frequency signals.

14. An integrated circuit for reception comprising:

a high-frequency amplifier for receiving a first signal and a second signal which are transmitted at mutually different frequencies;

a circuit for forming first and second local oscillation signals, whose frequencies are both the center frequency between said first signal and said second signal, and whose phases differ by 90° from each other;

a first mixer circuit for frequency-converting the received signal received by said high-frequency amplifier into a first intermediate frequency signal in accordance with said first local oscillation signal;

a second mixer circuit for frequency-converting the received signal received by said high-frequency amplifier into a second intermediate frequency signal in accordance with said second local oscillation signal;

a first phase-shift circuit to which said first intermediate frequency signal is supplied;

a second phase-shift circuit to which said second intermediate frequency signal is supplied, in which the amount of the phase shift differs by 90° from that of said first phase-shift circuit; and

an addition/subtraction circuit for performing one of addition and subtraction between the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit, which are integrated into one chip,

wherein, by switching the process in said addition/subtraction circuit to said addition or said subtraction, the intermediate frequency signal corresponding to said first signal or the intermediate frequency signal corresponding to said second signal is selectively extracted from said addition/subtraction circuit.

15. A reception integrated circuit for receiving a multiplexed signal in which a first ensemble having signals of a first plurality of programs and a second ensemble having signals of a second plurality of programs are frequency-multiplexed and transmitted, and for extracting, from this received signal, one of the signals within the signals of said first plurality of programs and the signals of said second plurality of programs, said reception integrated circuit comprising:

a circuit for forming first and second local oscillation signals, whose frequencies are both the center frequency between said first ensemble and said second ensemble, and whose phases differ by 90° from each other;

a first mixer circuit for frequency-converting the received signal into a first intermediate frequency signal in accordance with said first local oscillation signal;

a second mixer circuit for frequency-converting the received signal into a second intermediate frequency signal in accordance with said second local oscillation signal;

a first phase-shift circuit to which said first intermediate frequency signal is supplied;

a second phase-shift circuit to which said second intermediate frequency signal is supplied, in which the amount of the phase shift differs by 90° from that of said first phase-shift circuit;

an addition/subtraction circuit for performing one of addition and subtraction between the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit;

an intermediate frequency filter to which the output signal of the addition/subtraction circuit is supplied; and

a demodulation circuit to which the output signal of the intermediate frequency filter is supplied,

wherein, by switching the process in said

addition/subtraction circuit to said addition or said subtraction, the signals of said first plurality of programs or the signals of said second plurality of programs are selectively extracted from said demodulation circuit.

16. A reception integrated circuit comprising:

a high-frequency amplifier for receiving a first signal and a second signal which are transmitted at mutually different frequencies;

a circuit for forming first and second local oscillation signals, whose frequencies are both the center frequency between said first signal and said second signal, and whose phases differ by 90° from each other;

a first mixer circuit for frequency-converting the received signal received by said high-frequency amplifier into a first intermediate frequency signal in accordance with said first local oscillation signal;

a second mixer circuit for frequency-converting the received signal received by said high-frequency amplifier into a second intermediate frequency signal in accordance with said second local oscillation signal;

a first phase-shift circuit to which said first intermediate frequency signal is supplied;

a second phase-shift circuit to which said second intermediate frequency signal is supplied, in which the

amount of the phase shift differs by 90° from that of said first phase-shift circuit;

an addition circuit for performing addition of the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit; and

a circuit for inverting or non-inverting the phase of one of the signals of the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit, which are supplied to said addition circuit, which are integrated into one chip,

wherein, by switching between said inversion or said non-inversion, the intermediate frequency signal corresponding to said first signal or the intermediate frequency signal corresponding to said second signal is selectively extracted from said addition circuit.

17. A reception integrated circuit for receiving a multiplexed signal in which a first ensemble having signals of a first plurality of programs and a second ensemble having signals of a second plurality of programs are frequency-multiplexed and transmitted, and for extracting, from this received signal, one of the signals within the signals of said first plurality of programs and the signals of said second plurality of programs, said reception integrated circuit comprising:

a circuit for forming first and second local oscillation signals, whose frequencies are both the center frequency between said first ensemble and said second ensemble, and whose phases differ by 90° from each other;

a first mixer circuit for frequency-converting the received signal into a first intermediate frequency signal in accordance with said first local oscillation signal;

a second mixer circuit for frequency-converting the received signal into a second intermediate frequency signal in accordance with said second local oscillation signal;

a first phase-shift circuit to which said first intermediate frequency signal is supplied;

a second phase-shift circuit to which said second intermediate frequency signal is supplied, in which the amount of the phase shift differs by 90° from that of said first phase-shift circuit;

an addition circuit for performing addition of the output signal of said first phase-shift circuit and the output signal of said second phase-shift circuit;

an intermediate frequency filter to which the output signal of the addition circuit is supplied;

a demodulation circuit to which the output signal of the intermediate frequency filter is supplied; and

a circuit for inverting or non-inverting the phase of one of the signals of the output signal of said first phase-

shift circuit and the output signal of said second phase-shift circuit, which are supplied to said addition circuit, which are integrated into one chip,

wherein, by switching between said inversion or said non-inversion, the signals of said first plurality of programs and the signals of said second plurality of programs are selectively extracted from said demodulation circuit.